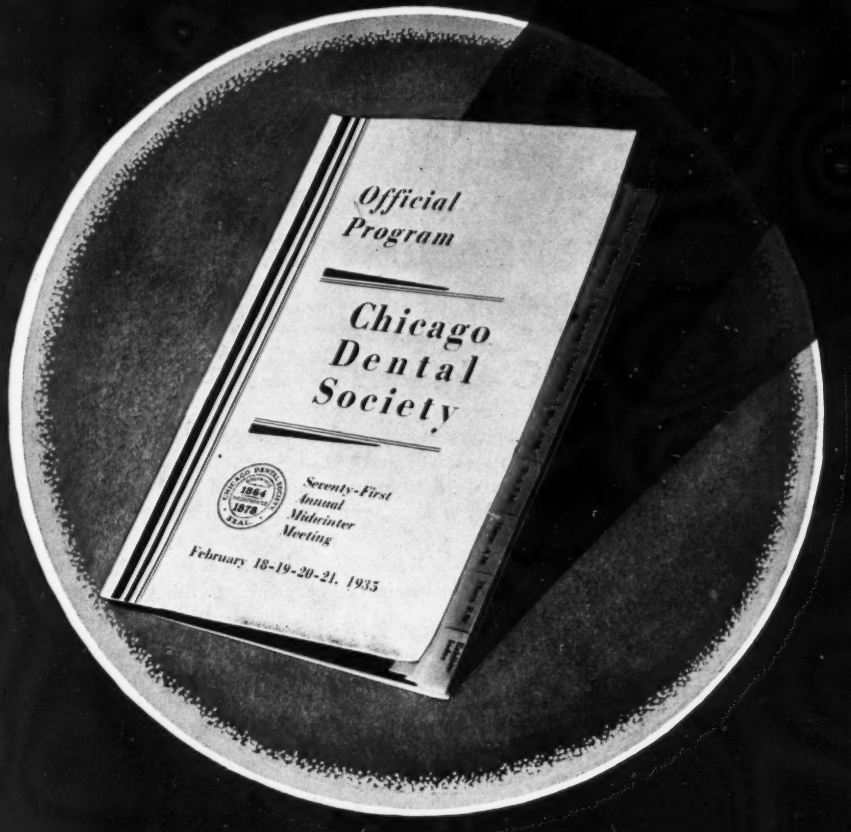
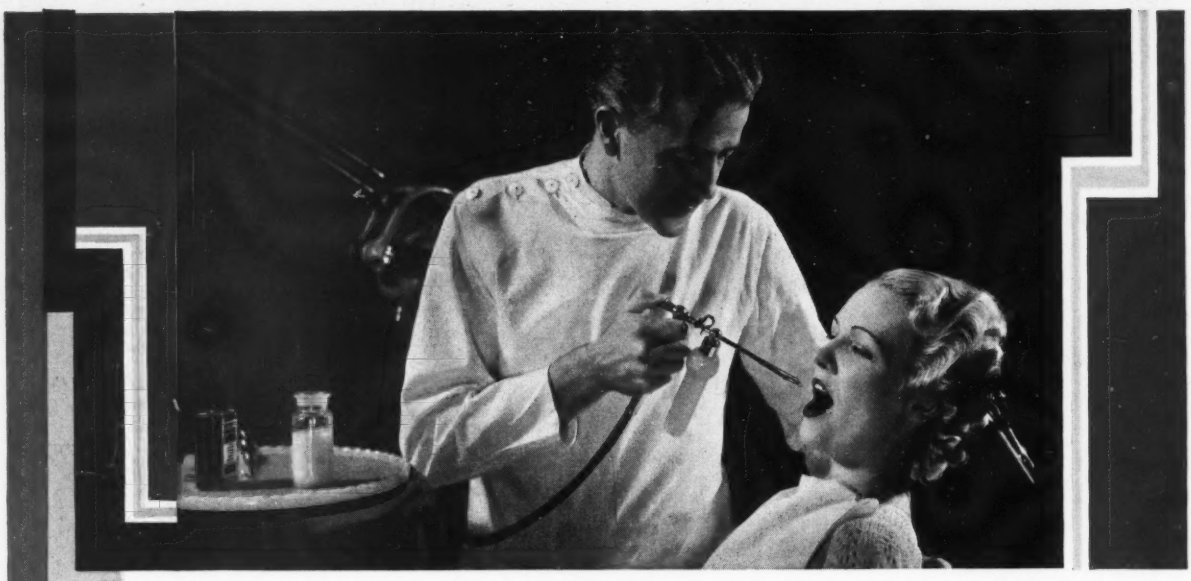
The DENTAL DIGEST





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The DENTAL DIGEST

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An Oral Hygiene Publication. Published monthly on the fifteenth by Dental Digest, Inc.

Entered as second class matter at the Postoffice at Ashland, Ohio, under the Act of Congress, March 3, 1879.

PUBLICATION OFFICES: 1005 Liberty Ave., Pittsburgh, Pa.
Merwin B. Massol, Publisher; Associates: J. J. Downes, J. W. Kaufmann, W. Earle Craig, D.D.S.; R. C. Ketterer, Publication Manager.

Subscriptions should be sent to the Publication Offices, 1005 Liberty Ave., Pittsburgh, Pa.

Manuscripts and correspondence regarding editorial matters should be addressed to the editor at 708 Church Street, Evanston, Ill.

Subscription rates, including postage:
$2 per year in the United States, Alaska, Cuba, Guam, Hawaiian Islands, Mexico, Philippines, Porto Rico. To Great Britain and Continent, $2.75; Canada, $3.50; Australia, $4.25. All other countries $2.75. Single copies, 25c.

DISTRICT OFFICES:
Chicago: Peoples Gas Bldg.; W. B. Conant, Western Manager.
New York: 18 East 48th St.; Stuart M. Stanley, Eastern Manager.
St. Louis: Syndicate Trust Bldg.; A. D. McKinney, Southern Manager.
San Francisco: 155 Montgomery St., Don Harway, Pacific Coast Manager.

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THE EDUCATION OF THE DENTAL PATIENT

V. THE DEVELOPMENT OF JAWS AND TEETH*

Fig. 1—Left side. New-born infant.

Fig. 2—Right side. Infant, aged 1 month.

Fig. 3—Left side. Infant, aged 4½ months.

Fig. 4—Left side. Age: 6 months.

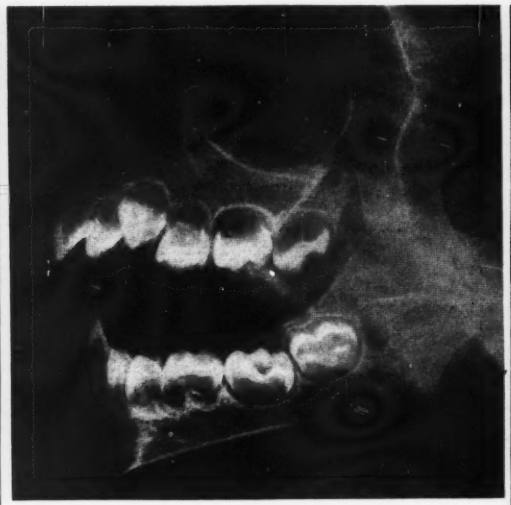

Fig. 5—Left side. Age: 9 months.

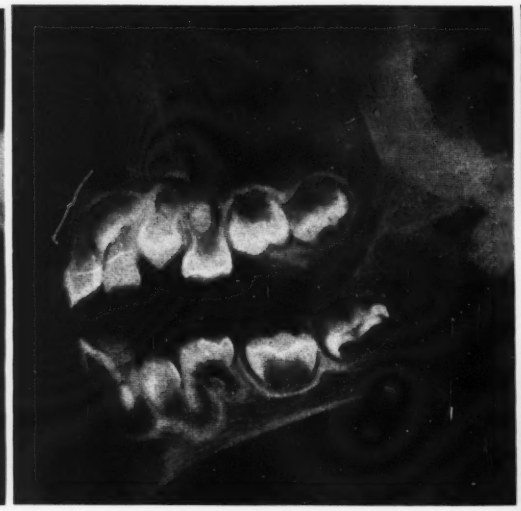

Fig. 6—Left side. Age: 1 year.

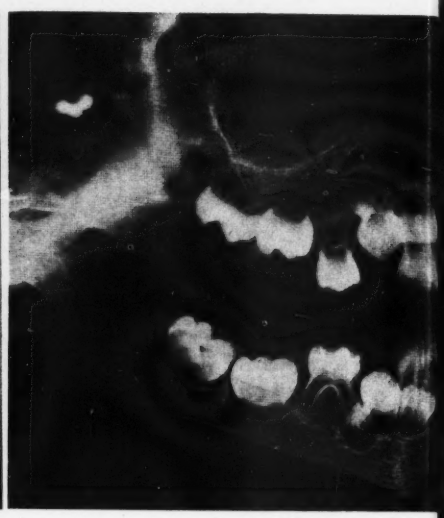

Fig. 7—Right side. Age: 15 months.

Fig. 8—Right side. Age: 2 years.

Fig. 9—Right side. Age: 3 years.

*This is the fifth chart in the second series intended for the use of the dentist in explaining important normal and pathologic dental conditions to his patient. The first series has been published in booklet form.

Fig. 10—Right side. Age: 4 years.

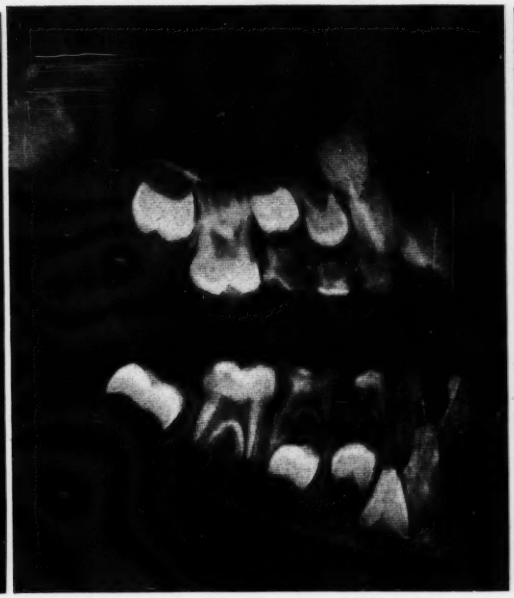

Fig. 13—Right side. Age: 7 years.

Fig. 16—Left side. Age: 9 years.

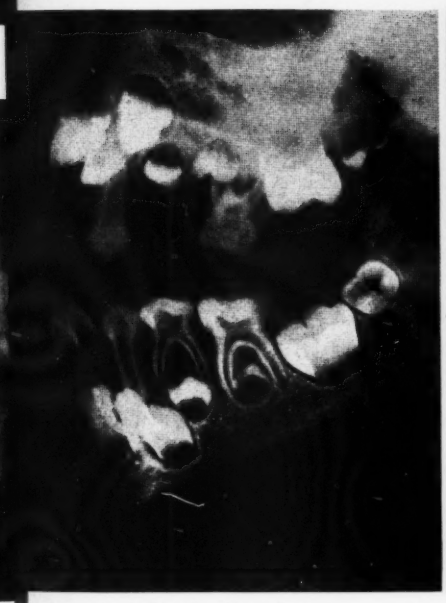

Fig. 11—Left side. Age: 5 years.

Fig. 14—Left side. Age: 7 years.

Fig. 17—Right side. Age: 10 years.

Fig. 12—Right side. Age: 6 years.

Fig. 15—Right side. Age: 9 years.

Fig. 18—Left side. Age: 10 years.

—From the Department of Children's Clinic, University of Illinois College of Dentistry.

SURGICAL CLOSURE OF AN EPITHELIALIZED OPENING

PAUL J. AUFDERHEIDE, D.D.S.
Cleveland

ONE of the most difficult oral operations dentists are called on to perform is the closure of an epithelialized opening from the mouth into the floor of the maxillary sinus.

When skulls are examined the close proximity of the apexes of the upper bicuspids and molars to the floor of the sinus is noticed; one wonders, therefore, that the complication of an opening in this region does not occur more often. Such openings are caused by (1) accidental opening during tooth extraction; (2) the sinus becoming acutely infected as a result of a tooth socket opening into it when the treatment is neglected; (3) irrigating an infected maxillary sinus too long through a tooth socket; (4) a root being unavoidably lost in the maxillary sinus and removed through a socket enlarged for this purpose; (5) accidental removal of the tuberosity during extraction; (6) an already existing connection from the apex of the tooth extracted and the maxillary sinus as a result of chronic infection; (7) preexisting chronically infected sinuses of nasal origin, resulting in necrosis of the floor of the sinus, especially around pulpless teeth where a favorable field for the destruction exists.

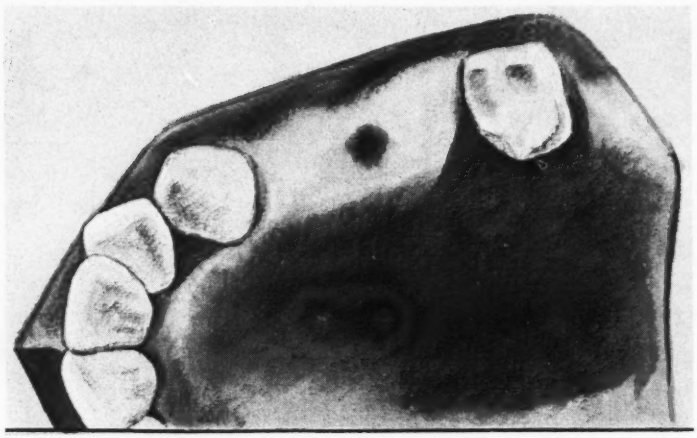

Fig. 1—Opening into maxillary sinus which has an epithelial lining and will persist until eliminated by surgery.

PREVENTION

Many of these epithelialized openings, caused by accidental exposure of the maxillary sinus during extraction, can be prevented. When the alveolar process is shallow vertically and the sinus has been exposed, the soft tissues should be sutured in good apposition immediately after extraction. If the alveolar process is thick vertically (good distance from the crest of the ridge to the floor of the sinus) stitches are usually not necessary. Mechanical scarification every day will keep a healthy blood clot in the socket, forming a medium whereby granulation tissue can fill the opening.

When the sinus is acutely infected after accidental opening by extraction, it should be irrigated every day until the wash is clear for four visits. This can be done through the tooth socket for a few days, after which it should be irrigated through an opening made from the nasal cavity under the inferior turbinate bone into the sinus. Irrigating through a socket too long (more than ten days) will allow epithelium to line the socket, thereby creating the permanent opening.

Roots lost in a sinus should be removed through a window made in the canine fossa and not through an enlarged tooth socket. The incision should be made at the muco-buccal fold where healing usually takes place by first intention. Irrigation should be done through this incision in the case mentioned.

When the tuberosity is loosened, bone is left in place if attached, and the tissue is sutured in apposition.

Whenever the maxillary sinus is accidentally opened by extraction and found to be chronically infected, it should not be considered a misfortune, but rather fortunate in that such infections may otherwise go undiagnosed for years. The sinus should have the indicated surgical treatment as soon as possible. This minimizes

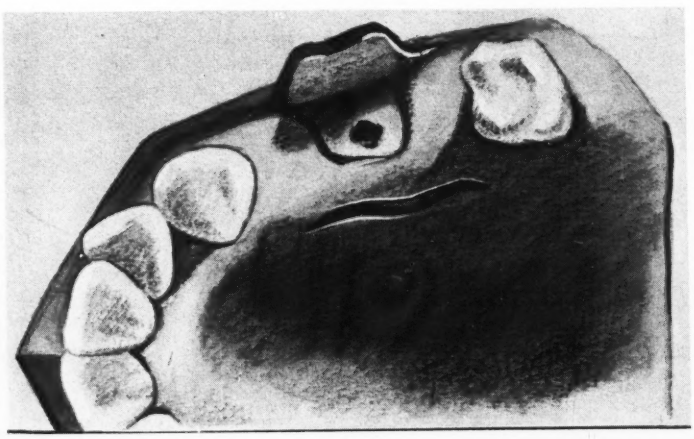

Fig. 2—Flap made as far as muco-buccal fold. Note wide base for blood supply. The darkened edges represent the scarified areas so that denuded tissue can be brought in contact with denuded tissue. Also incision on palate and freeing of mucoperiosteum between it and the opening into sinus allows a slight sliding over of this tissue and simplifies the placing of sutures.

the time for drainage through the tooth socket and eliminates the cause of many of these permanent openings. This applies if chronic infection was of dental or nasal origin. The socket is scarified to hasten and assure the closure of the tooth socket.

My observation has convinced me that an appreciable percentage of cases in which pus drains from the sinus through a socket a day or so after extraction and in which roots are lost in the sinus, a chronically infected sinus is found by thorough examination. Also many chronically infected sinuses are caused by proliferation of chronic inflammatory tissue from infected root apexes into these sinuses.

The reason for the closure of these old openings is to prevent infection of the sinus from saliva or food that would be forced into it. Such openings are also uncomfortable to the

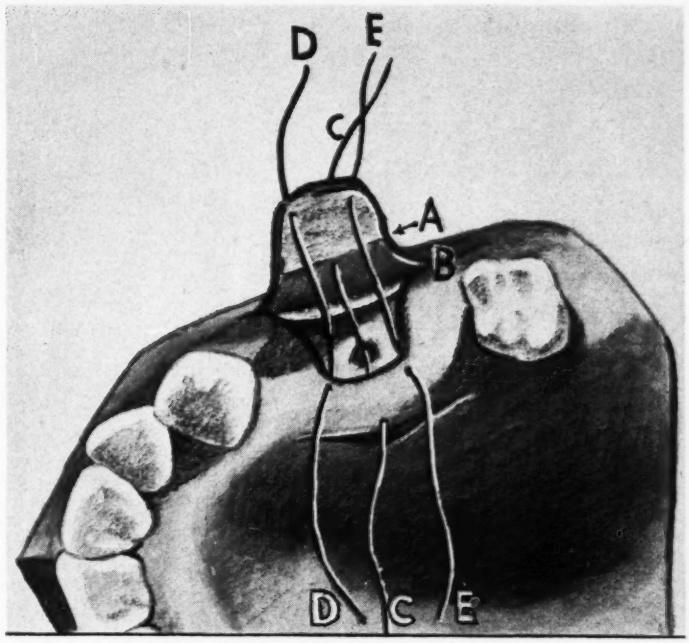

Fig. 3

Fig. 3—Incision just through the periosteum running anteroposteriorly. Note the distance that the flap can be stretched from A to B. This distance from A to B is exposed connective tissue. Note the stay suture C deep in the muco-buccal fold and palatal tissue. Also note D and E sutures to keep denuded tissue in apposition. In larger openings there are sometimes more apposition sutures necessary. Note also incision in palate so that palatal tissue can be drawn over. It also makes possible the insertion of the stay suture well over into the tissue.

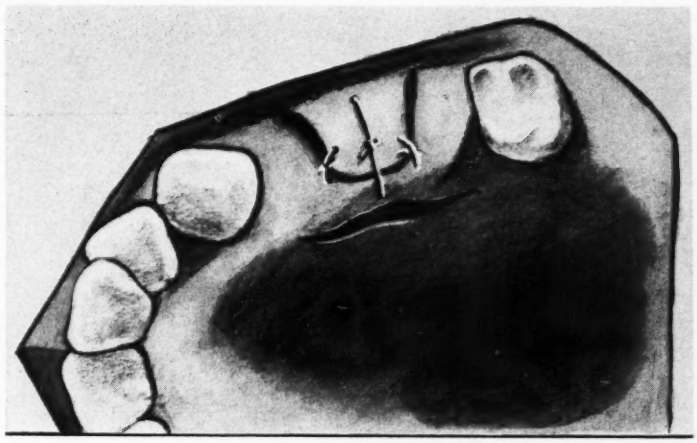

Fig. 4

Fig. 4—Flap sutured into position. The anterior and posterior sutures are the sutures for apposition engaging a small amount of tissue. The middle suture is the stay suture engaging a large amount of tissue. Notice at the palatal incision the amount that the palatal tissue is retracted laterally. The palatal mucoperiosteum between incision and flap has been freed from the bone. Black silk sutures are used as they are more comfortable to the patient. The muco-buccal fold is pulled down a little, but will recede to its normal position during healing by scar contraction.

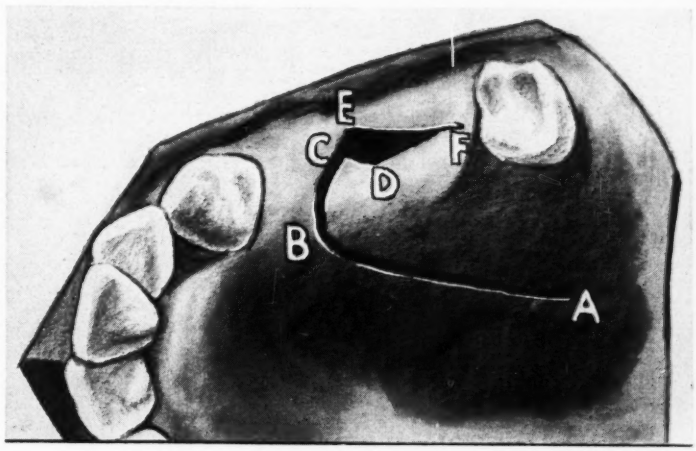

Fig. 5

Fig. 5—Occasionally good judgment may require a palatal flap. In that case an incision is made from A to B, keeping it far enough toward the medium line to include anterior palatine artery. The incision from B to C is made so that B is anterior to C. This provides for a little excess tissue when flap is slid over. Note the triangular piece of tissue removed between D, E, and F. This allows the palatal flap to be moved laterally without resistance, which minimizes strangulation of blood supply.

patient. In edentulous cases they interfere with the proper suction to retain a denture.

Many of these cases should be handled in conjunction with a rhinologist, because deformed turbinates, deviated septums, infection of other sinuses, physical condition, and polypoid tissue in the nose—all these should be considered if intelligent treatment is to be rendered.

Treatment

Before closure of these chronic epithelialized openings is attempted, one must be certain that a healthy conditions exists in the sinus involved. Flap surgery will not hold in an infected area. The closer aseptic surgery is approached, the better the prognosis. If the sinus is infected the indicated surgery should be performed and the sinus rendered healthy before the flap operation is done.

Precautions in Flap Surgery

1. Flaps should be made large enough.

2. The blood supply should not be cut off by incisions or by strangulation in pulling the flap in the new position.

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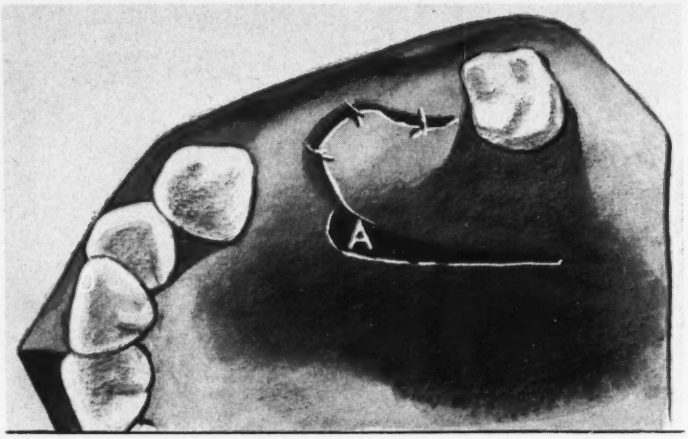

Fig. 6—Palatal flap sutured into position. Space marked A is osseous tissue which will be filled by a blood clot and in which granulation tissue will develop. The operator should remember to keep the denuded surface against the denuded surface in area in which sutures are inserted. No buccal flap is being used here.

3. The flaps must have wide bases to ensure good blood supply.

4. The operator should be sure that all edges are well scarified in order that healing can take place by first intention. Epithelium against epithelium will never unite.

5. The patient should be instructed not to blow his nose for four days and to be careful of the operated area. The patient is instructed to apply mercurochrome three times daily on the wound.

HAVE YOU VOTED ON THE HEALTH INSURANCE POLL?

IF NOT, BE SURE TO DO SO BEFORE JANUARY 26.

SEE PAGE 16 - - JANUARY ORAL HYGIENE.

MAXILLARY SINUS ROENTGENOGRAPHIC TECHNIQUE FOR THE DENTIST

R. BULLOCK JONES, D.D.S.
Willimantic, Connecticut

EVERY dentist has witnessed that type of dental pain wherein all upper teeth on one side posterior to the second bicuspid would be aching, and he was at a loss to find the cause. A good maxillary sinus roentgenogram would probably have shown evidence of some form of sinus inflammation or disease. This is also true in those cases in which acute suppuration of the maxillary sinus sets in after an extraction. The progress of these cases must be watched intelligently and if the otolaryngologist is to be consulted, he must know whether the floor of the sinus is below the floor of the nose, or whether there is a complete partition dividing the involved sinus. When the floor is above the floor of the nose, the distance above the floor must be measured and reported, as an extremely thick floor would influence the location of the site of puncture, in the event that this procedure were to be followed in the treatment. When the floor is above the floor of the nose, it may mean either that the sinus is undeveloped and small, or it may mean a displaced sinus; one which extends upward into the ethmoid region, passing around the inferior orbital margin, and encroaching on the ethmoid. In a case of this type, attention must be called to the relation of the orbit to the sinus, because the distance from the nasal wall to the orbit is narrowed, and a trocar, when inserted high enough to miss the floor, might penetrate the orbit. The otolaryngologist's success in treatment will depend on an accurate knowledge of the particular anatomy. He has a right to an intelligent report from the dentist.

I wish to say at the outset that I do not believe any dentist should attempt to qualify for expertness in diagnosing pathologic conditions in all the nasal accessory sinuses. This requires x-ray machines that are different from those owned by the average dentists; it requires an intimate knowledge of stereoscopy, and a wide clinical knowledge before the patient can have a helpful diagnosis. This is work for the physician. I do insist, however, that the dentist should be familiar with all possible conditions of the maxillary sinus.

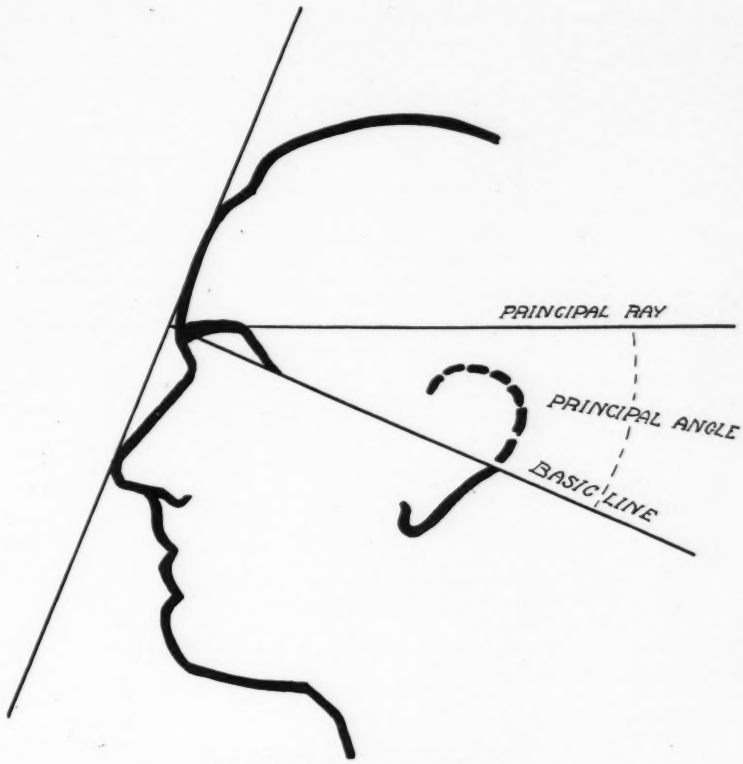

Fig. 1—The Doctor Caldwell angle.

Before me is a quotation from Doctor Howard Raper's[1] excellent book on roentgenography:

"Q. What range of voltage is used in the practice of radiodontia?

"A. For intra-oral work about 45,000 to 60,000. For anterior-posterior antrum work about 60,000 or slightly more."

This statement is, of course, an accurate one. If, however, the average dentist does not own 60,000 or more volts and still ought to produce perfect roentgenograms of the sinus, is there any way to overcome this disadvantage? I believe there is. Let us assume that the customary machine for making thorough roentgenograms of the sinus is a 30 m. a., 60 k. v. machine and that the average film target distance is from 20 to 25 inches. Also let us assume that the average dental roentgenogram is a 10 m. a., 45 k. v. machine and that the average film target distance is from 6 to 10 inches. The chief influences on the time of exposure are: (1) milliamperage, (2) voltage, (3) distance, (4) density, (5) thickness.

Milliamperage—We know that energy to the film varies in direct proportion to the milliamperage, so that other factors being constant, the photographic effect on a film is three times as great at 30 m. a. as at 10 m. a.

Voltage—Other factors remaining constant, the time of exposure varies in *inverse* proportion to the square of the voltage. In other words, if 60 k. v. are squared and 30 k. v. are squared and the ratio is inversed, one-fourth as much exposure time

[1] Raper, H. R.: Radiodontia: Questions and Answers.

will be needed with 60,000 volts as with 30,000. Following out the mathematics, a 60 k. v. machine will require approximately one-half the exposure time that a 45 k. v. machine will need.

Distance—Still one more major influence on exposure time must be discussed. Other factors remaining constant, the time of exposure varies in direct proportion to the square of the film target distance. If one squares 20 inches (400) and squares 10 inches (100) he finds that it will require only one-fourth as much exposure time at 10 inches as it will at 20 inches. With these laws well in mind, let us work out an example, using the two machines described. I realize fully that when one tries to apply the exact science of mathematics to the inexact science of roentgenography, the effort is likely to prove exasperating and the results not too satisfying. However, I submit the figures on which I succeeded in taking several hundred maxillary sinus roentgenograms during the last two years without causing an erythema or an alopecia.

Problem—Assume that 30 m. a., 60 k. v., 20 inch target requires 2 seconds for 23° angle A. P. film. What does 10 m. a., 45 k. v., 10 inch target require?

3 times as much exposure for decreased amperage (3 x 2) equals 6 seconds.

2 times as much exposure for decreased voltage (2 x 2) equals 4 seconds.

One-fourth as much exposure for decreased target distance equals ½ second.

ANSWER: 10½ seconds.

This is only one of the three angles the dentist must take to get complete views of the sinus (to be described later). Assuming that the first machine requires 3 seconds' exposure for a "Waters" position film, then the second machine will require a 15¾ second's exposure. The third film (a lateral) will require only 2 seconds and the total exposure is in the safe milliamperage second dosages of 300 m. a. (determined by multiplying the amperage by the number of seconds). Thus, I believe, that the answer to the question: Can increasing the time of exposure compensate for any lack of voltage, should be theoretically, yes, and practically, yes, provided good intensifying screens are used and proper angulation is employed, so that retakes will not be necessary.

I wish to stress the necessity of knowing the dangers of over-exposure. This can best be done by quoting from the writings of Doctor Eugene Caldwell:[2]

Owing to the thickness and opacity of the skull and brain, it is necessary to make long exposures, and to use rays of rather high penetration. The use of rays of too high penetration, however,

[2] American Quarterly of Roentgenology, January, 1907.

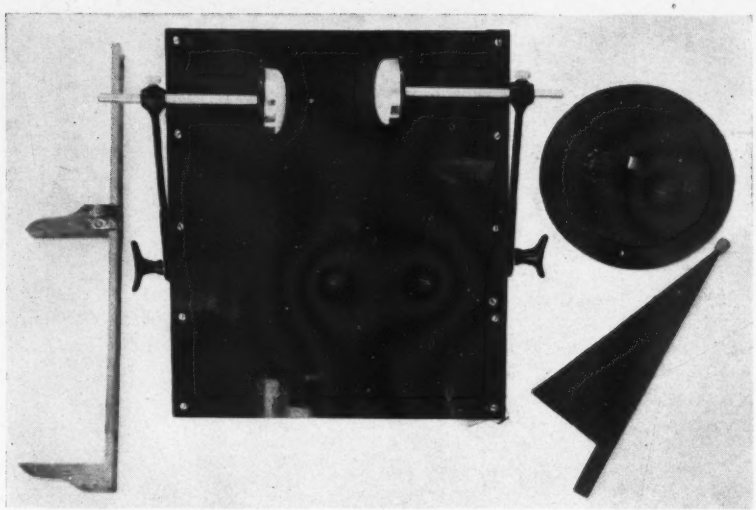

Fig. 2—Accessories needed for accurate roentgenograms of the sinus. The shoe-fitter's rule will determine the measurement of the head. The angle marker is easily made by measuring a 23° angle with a protractor on any stiff metal and cutting out according to the design shown. Its use is shown in Fig. 3. The blocking mask is used for protecting film while creating the black border that helps to bring out contrasts. The casette is necessary to secure head immobility.

results in a lack of contrast in the negative. Rays of low penetration act more energetically upon the scalp, and longer exposures are necessary with them in order to obtain sufficient effect upon the photographic plate. Unnecessarily long exposures must be avoided because they increase the liability of blurred pictures due to movements of the subject, and also because they increase the danger of harmful effects of the rays, both upon the scalp and upon deeper structures.

The necessity for long exposures, and sometimes for repeated exposures, together with failure to secure the proper degree of penetration and sufficient distance between tube and scalp, sometimes causes x-ray alopecia, and even x-ray dermatitis over the back of the head. Not only these unfortunate accidents, but also the disclosures of Doctor Edsall, of Philadelphia, and others, as to profound effect of x-rays upon all living cells, remind us of the importance of working with special caution and certainty in this region. Indeed, I think it is unwise to expose the same individual during a period of three weeks, for a longer time than is necessary to obtain two or three radiographs in the anteroposterior position.

It will be noted in the technique to be described that in addition to adhering to the exposure technique quoted, a towel is placed over the back of the head to act as a filter, unless the machine is equipped with an aluminum filter. Alopecia used to be a common end-result in taking anteroposterior roentgenograms. The hair would start falling out about a week or a month after exposure and would take from two to six months to grow again.

TECHNIQUE FOR SINUS ROENTGENOGRAMS

Doctor Caldwell continues:

The appearance of a radiograph of the face and its usefulness in diagnosis depend much upon the position of the tube and the direction of the rays with reference to the base of the skull. We must avoid superimposing the shadow of the horizontal plate of the frontal bone upon that of the frontal sinus, or the shadows of the petrous bones upon those of the maxillary sinuses, or the shadow of the basilar process of the occipital bone upon that of the ethmoid cells. Any of these undesirable results and some others as well may occur if the exposure is made in a careless manner. The necessity for a standard distance and position of tube is, therefore, apparent. In order to secure a standard position for the source of rays, we may select one of the diverging rays which produce the picture and measure the angle which it makes with a plane corresponding approximately to the base of the skull. The ray I have selected for this purpose is the ray which passes through the skull in the mesial plane and pierces the center of the glabella (Fig. 1). This ray I have called for convenience the principal ray. A suitable plane which can be readily located by external landmarks is the one which passes through the centers of the external auricular orifices and the center of the glabella (point above nose between superciliary ridges). To save time, I shall call this plane the basal plane and the angle between it and the principal ray, the principal angle. With a fixed distance between the target of the tube and the glabella the general direction of the rays may be expressed by the measurement in degrees of the principal angle.

From measurements of a number of skulls which had been split in the median plane, and from a number of radiographs of skulls and heads at different measured angles I have found that the best results are obtained when the principal ray makes an angle of 23° as the standard angle for the principal ray, and the basal plane, or the standard principal angle. With this direction of ray, the shadow of the edge of the horizontal plate of the frontal bone, where it joins the wings

of the sphenoid, appears as a transverse line passing across the orbit about one-half inch below the supra-orbital ridges. The appearance, in a symmetrical picture, of this shadow in the position mentioned is a fair indication that the principal angle is approximately correct.

I now wish to quote from the excellent textbook of Doctor Frederick M. Law on NASAL ACCESSORY SINUSES and edited by James T. Case, M. D.:

While the angle is measured from the glabella, it has been found in teaching that a more satisfactory point to measure from is the lower edge of the eyebrow. This is more clearly visible when the patient's forehead is placed against the film and one is looking at the side of the head.

In order to secure a film that will show the frontal sinuses, the ethmoids and the antra in their true relationship, it is absolutely necessary that the angle of 23° be strictly adhered to. No guess work will do.

I use from 10½ to 13 seconds' exposure with a 10 m. a. 45 k. v. machine for the angle depending on whether the A. P. measurement of the head is more than 8 inches.

Adult heads vary in their postero-anterior diameter from 7¼ to 9½ inches. From 7¼ up to 8 inches there does not seem to be any difference in the resistance to the ray, but from 8 to 9½ inches there is sufficient difference to affect the quality of the film. Age and sex are also factors. Patients over 45 require a little more exposure. Women require a little less exposure than men.

The accessories the dentist will need are shown in Fig. 2 and are borrowed from the suggestions by Doctor Law. The shoe-fitter's rule will determine the measurement of the head. The angle marker is easily made by measuring a 23° angle with a protractor on any stiff metal and cutting out according to the design shown. Its use is shown in Fig. 3.

The blocking mask is used for protecting film while creating the black border that helps to bring out contrasts. The number plate and right and left letters are used in conjunction with the blocking mask. I give two seconds' additional exposure to the film when these have been correctly placed. The result is shown in Fig. 4.

The second roentgenogram angle of importance to the dentist is known as the Waters position and was worked out by Doctor Waters. In so far as the sinuses are concerned, this position is invaluable.

The 23° or nose forehead position will show the frontals and ethmoids to the best advantage, but unfortunately the image of the petrous bones is superimposed on the upper third of the maxillary sinuses and in many

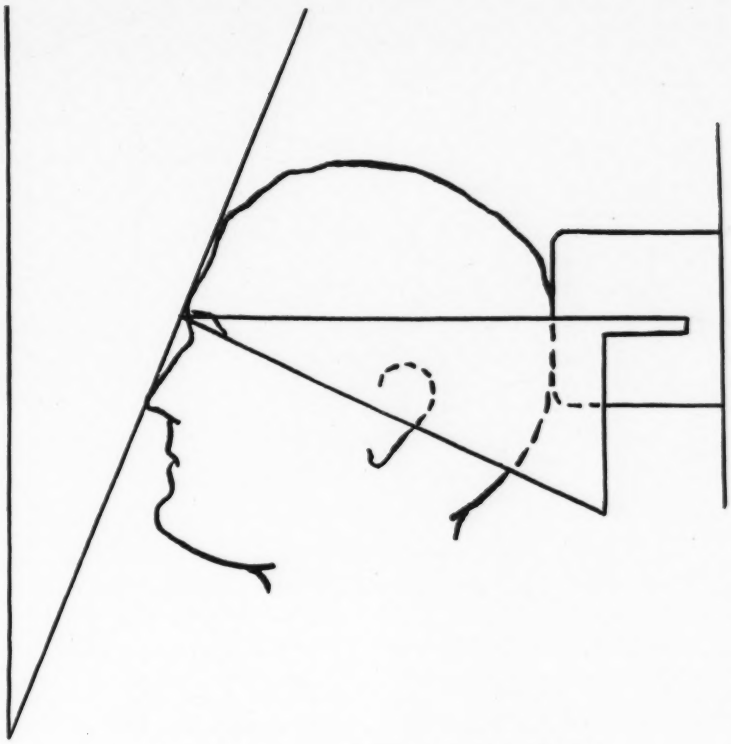

Fig. 3—Use of the angle marker to obtain 23° angle.

Fig. 4—Roentgenogram of sinus with 23° angle showing border created by using the blocking mask.

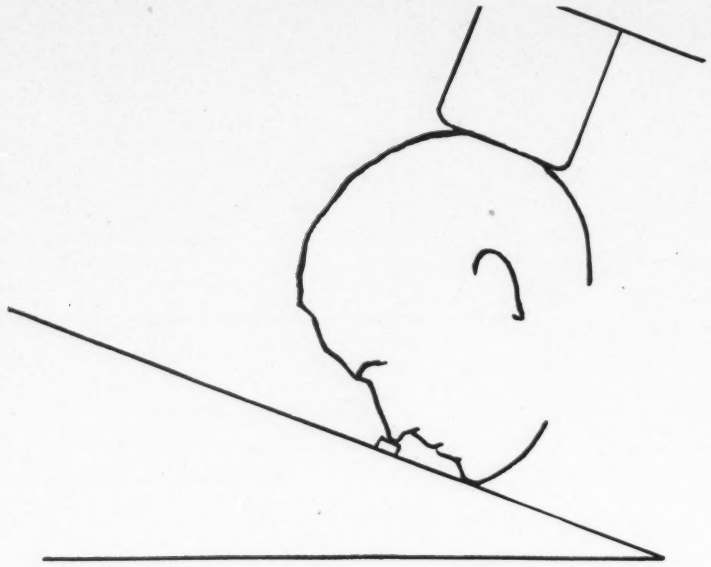

Fig. 5—Support of nose in the Waters position for a roentgenogram.

cases the line of the occipital bone cuts across the floor. In order to show the sinuses more clearly, the angle of the ray was altered by Doctor Waters so that with the image of the petrous bones well down out of the way, the entire outline of the sinuses can be seen, free from any obscuring structures.

Waters Position Technique

Only 3 rules are essential: (1) chin must rest on plate; (2) long axis of tube must be parallel to plate; (3) the nose of the patient should be from 1 cm. to 1.5 cm. from the plate. *Under no condition should nose touch the plate.*

The importance of knowing which style head one is taking is readily seen by the fact that in people with concave faces, the course of the base of the skull is quite high necessitating an increase of 0.5 cm. in the distance of the nose from the plate. In the convex shaped face the nose is placed only 1 cm. away with the long axis of the tube still remaining parallel to the plate. Therefore, it is the distance of the tip of the nose from the plate with the tube parallel to the plate, that enables one to make x-rays of sinuses without projecting the shadows of structures of the base of the skull and petrous portions of temporal bone into maxillary antra.

I use small rubber blocks of 1 and 1.5 cm. fastened to blotting paper to support the nose in taking this angle (Fig. 5). My exposure time for this angle ranges from 13 to 16 seconds. The result is shown in Fig. 6. I do not believe the image of the block in the nasal region detracts from the value of this angle.

The third roentgenogram that the dentist will need to use is the lateral view. Most dentists are familiar with this technique. The only requisite is to have the sagittal plane of the head parallel to the plate. The tube is centered so that the central ray will superimpose the two malar processes of the maxillary bone. From this view can be seen the position of the floor of the sinuses and their relationship with the teeth. Polyps or cysts in the sinuses can be shown in this view. The exposure time is 2 seconds.

Apparatus and Instruments

A poor film may lead to an entirely erroneous diagnosis. A technically perfect film is one that will show all the sinuses to the best advantage, without overlapping or distortion; one in which the detail of the finest bony septums is clearly seen without distortion; a film that is of such density as to show any change in the quality of bone entering into the formation of these septums; a film that will show the change in the outline of a sinus wall which may be the result of a thickening of osteitis or to fuzz from a swelling of the mucous membrane; a film that will show the change resulting from a rarefying osteitis or a condensing osteitis of the septums. In other words, the film must show in absolute sharpness the bony detail of the skull. In order to accomplish this the following factors are necessary: (1) a fine focus tube (which most dental machines have); (2) absolute immobility of the head; (3) perfect screens; (4) care and patience in arranging the parts.

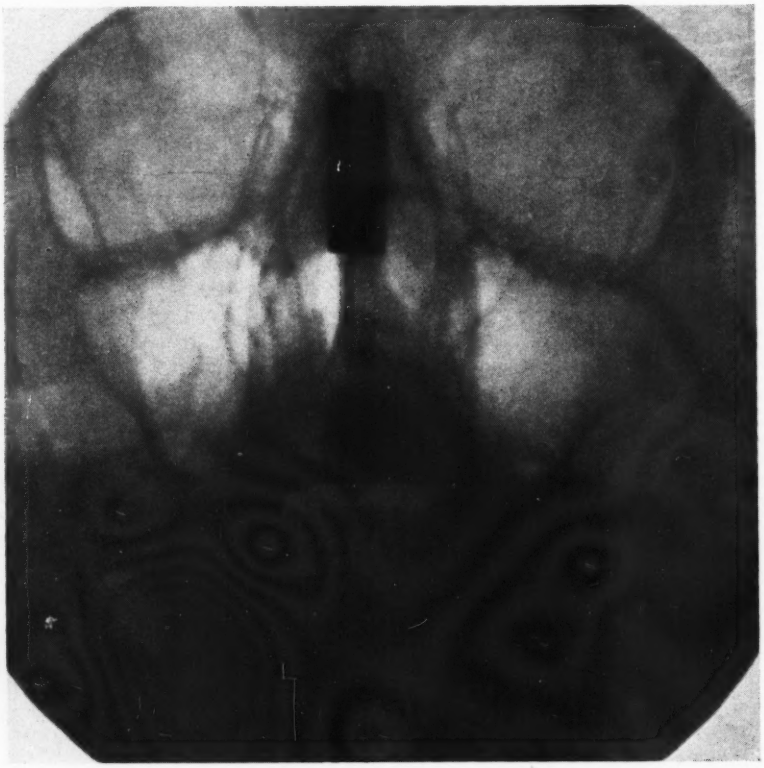

Fig. 6—Waters or nose-chin position roentgenogram.

There is no branch of roentgenology in which attention to detail is more important than in sinus work.

Diagnosis

There is little in the dental literature about the correct interpretation of roentgenograms of the maxillary sinus. There is a way, however, for dentists to become skilled in diagnosis, but before I discuss it, I should like to stress once again the increasing necessity for dentists to acquaint themselves more fully with pathologic conditions in the accessory sinuses of the nose. There are many dental surgeons who are doing radical surgery in the sinus without the benefit of perfect roentgenograms. Doctor Frederick E. Hasty in an article published in 1931 under the title, Roentgenology as an Aid to Practice of Otology and Rhinology, makes the following statement:

Roentgenograms poorly made and improperly interpreted will lead to many serious mistakes, and unless the work is correctly done from beginning to finish, the patient would perhaps be better off without any pretense at an x-ray examination. The time is not far distant when a surgeon will be censored for operating on a paranasal sinus without the aid of good x-rays. Such a study of the diseases of the paranasal sinuses will, I hope, *decrease very markedly* the number of operations hastily planned and inadequately executed in these fields. There are certain types of pathology of the paranasal sinuses which will produce little, if any, definite pain, and likewise cause little, if any, drainage. Because of this, the patient is not likely to give a history that would lead one directly to suspect the location of pathology. This is particularly true in instances where disease about the roots of teeth has extended to the lining membrane of an antrum.

702 Main Street.

Doctor Hasty states in a report of a case:

The teeth, which were badly infected, had been removed but the patient continued to show evidence of focal infection. Since, however, on transillumination the antra were clear, and there was not a great deal of drainage, and irrigation had been negative, competent men had pronounced the sinuses as not being the source of infection. Too much stress cannot be laid upon the fact that lack of secretion in the nose and lack of findings on irrigation are not to be taken as positive evidence that there is not disease in an antrum.

The secret of this type of pathology lies in the fact that the disease is beneath the lining membrane and that there may be little or no accumulation of mucus or pus within the free cavity. This is due to pathology about the teeth. The otolaryngologist and dentist must cooperate and must carefully study their cases.

To emphasize my statement that the dentist must become better acquainted with pathologic conditions in the accessory nasal sinuses, I quote from an article by Doctor George R. Warner.[3]

Dental literature is notably devoid of anything on this subject during the period covered by the Dental Index, viz. from 1911 to and including 1921. There is an article recorded, that by Paul P. Camp in the Pennsylvania Dental Journal for 1915-1916. The writer recalls seeing but five articles on this subject during the last four years, yet he is impressed with its importance and believes that the majority of the profession would be likewise impressed upon thoughtful consideration of the subject.

The contiguity of the structures under consideration, as well as the consanguinity of the blood and nerve supply, makes them so closely related, that the relation should be recognized, even though circumstances over which the present generation of physicians and dentists has no control, have divorced the two professions . . . The maxillary sinuses being the most dependent of the paranasal sinuses, naturally cannot drain into the others. Moreover the ostium maxillare, being so small, is usually closed by the inflammation of the membrane and thus precludes, not only drainage, but aeration, and thereby adds to the discomfort of the patient and the difficulties of treatment. But its treatment promises better results in the acute stage than in a chronic condition. Added to this the danger of extension of sinusitis from this sinus to other sinuses, growing with its chronicity, even though it is the most dependent of the sinuses, throws the greater responsibility upon the dentist to make an early diagnosis of a maxillary sinusitis.

It not infrequently happens that the maxillary sinuses act as reservoirs for the drainage of mucopurulent fluid from the other sinuses. This is an important fact, because a dentist might undertake the treatment of a diseased maxillary sinus, which was acting as a reservoir for fluid from the other sinuses, in which case treatment through the mouth would be worse than useless.

A great deal has been written concerning the pathology of the paranasal sinuses, and the dentist who intends to fulfill his responsibility to the sufferers from paranasal sinus disorders should avail himself of the opportunity to quiet study in the nearest medical library.

How can the dentist learn to interpret roentgenograms of the sinus? It is advisable for him to take a course of instruction from the best physician available who is doing good sinus roentgenography, and to procure one of the two or three good books available on roentgenographic technique employed for the nasal accessory sinuses. These books contain key plates and many plates showing all types of pathologic conditions.

[3] Warner, G. R.: The Interrelation of the Accessory Sinus of the Nose with the Oral Cavity in Oral Diagnosis, D. Items Int. 48:640 (September) 1926.

CASE REPORT OF FOURTH MOLAR ANOMALY

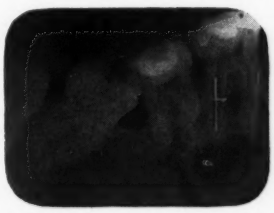

Fig. 1—Lower right third and fourth molars.

Fig. 2—Lower left third and fourth molars.

A woman, aged 22, had an abnormality in the third molar region on the left side. Roentgenograms disclosed a fourth molar. There were no symptoms despite the fact that the third molar was almost destroyed by caries. I removed the two teeth on August 17, under block anesthesia. There were no postoperative complications.

Roentgenograms of the lower right side also disclosed a fourth molar. I removed the lower third and fourth molars August 17. There was some swelling and discomfort on the third day following extraction. Irrigation was instituted and the patient made a normal recovery.—Edwin T. Jipp, D.D.S., *Blair, Nebraska.*

THE PROFESSION AND THIRD PARTY PRACTICE

HERBERT E. PHILLIPS, D.D.S.
Chicago

WHY the Problem of the Profession Is Imminent—The first column in Chart 1 represents the average incomes[1] of wage-earning groups in 1929. It will be noted that there are 37 per cent of the families in the comfortable group having $1800 and over a year. It is from this group that dentists in 1929 received the larger portion of their incomes. The groups below this range of income were unable to budget for dental care except that of an emergency nature.

In 1932 the picture changed and there were 9.5 per cent of the population who were able to contribute for *adequate* dental service. For the 39 per cent in the moderate group and for the upper ranges of the poor group, about 70 per cent of the population in all, health insurance is being suggested. For the group not included in the two former groups, State dentistry is now being provided. In this group are the indigent and unemployed on relief.

Types of Insurance—Chart 2 shows the types of health insurance in use: (1) Voluntary Insurance is the type that is used by lodges, trade unions, or other organizations of a

[1] Income Chart, modified from: Sydenstricker, Edgar: Sickness and the New Poor, Survey Graphic 23:161 (April) 1934.

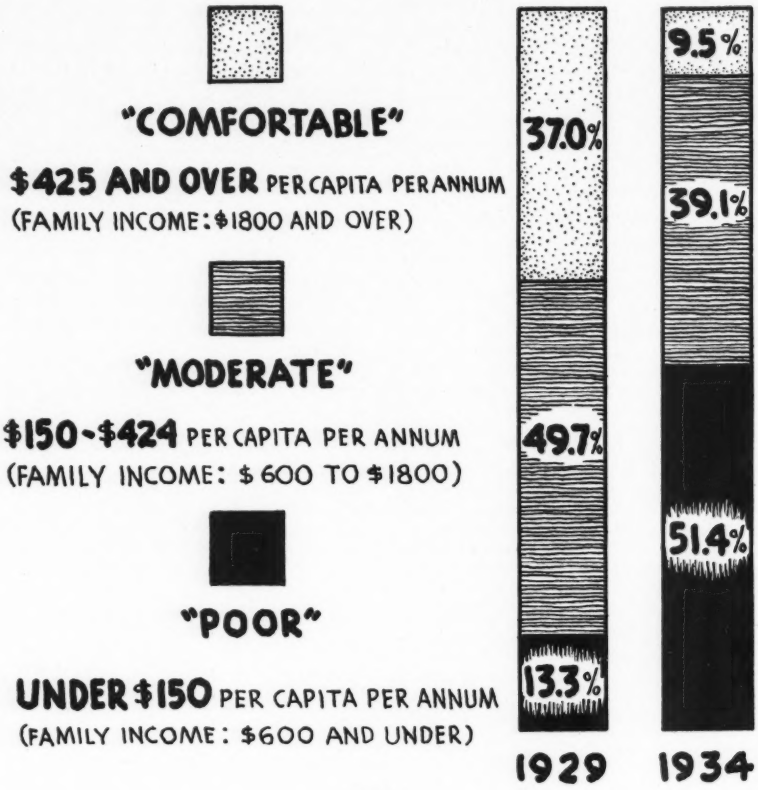

Chart 1

CHART 2

TYPES OF HEALTH INSURANCE

1. **VOLUNTARY INSURANCE:** Monthly or yearly sum collected from each person.
2. **VOLUNTARY CONTRIBUTORY INSURANCE:** Monthly or yearly sum from employee and employer. Funds are usually taken out of wages and controlled by employer.
3. **INDUSTRIAL COMPULSORY INSURANCE:** The same as Voluntary Contributory Insurance except that **all** employees are **required** to contribute.
4. **COMPULSORY HEALTH INSURANCE (SOCIAL INSURANCE):** In which a law is passed compelling certain income groups to become insured. Funds may be collected only from employees; from employees and employer; or from employees, employer, and government. Generally administered by commission.

similar kind; (2) Voluntary Contributory Insurance is now being used in many industries; (3) in some industries, however, all persons must contribute; (4) Compulsory Health Insurance is the fourth type which is now used in twenty-six leading countries in the world. This is the type being advocated in America at the present time on a national scale.

Social Insurance Circle—Chart 3 gives an idea of what is included in the social insurance circle about which so much has been heard: (1) Workers' Compensation Insurance, which is now operative in forty-six states. Seventy-five million dollars a year is paid for medical service in this type of insurance. It is practically all under the control of insurance carriers, and this gave rise to many pernicious forms of contract practice. The difficulties of physicians in this service are largely traceable to this fact. (2) Old Age Pension laws are now in force in twenty-eight states, largely through the efforts of the American Society for Social Security, a lay organization which is now turning its attention to health insurance legislation. (3) Unemployment Insurance is in force in one state, Wisconsin, and this state provided the pattern presented for discussion at the recent public meeting of President Roosevelt's Committee on Economic Security. (4) Sickness Insurance is one of the segments in the circle, and no social insurance scheme is complete without the inclusion of Health Insurance.

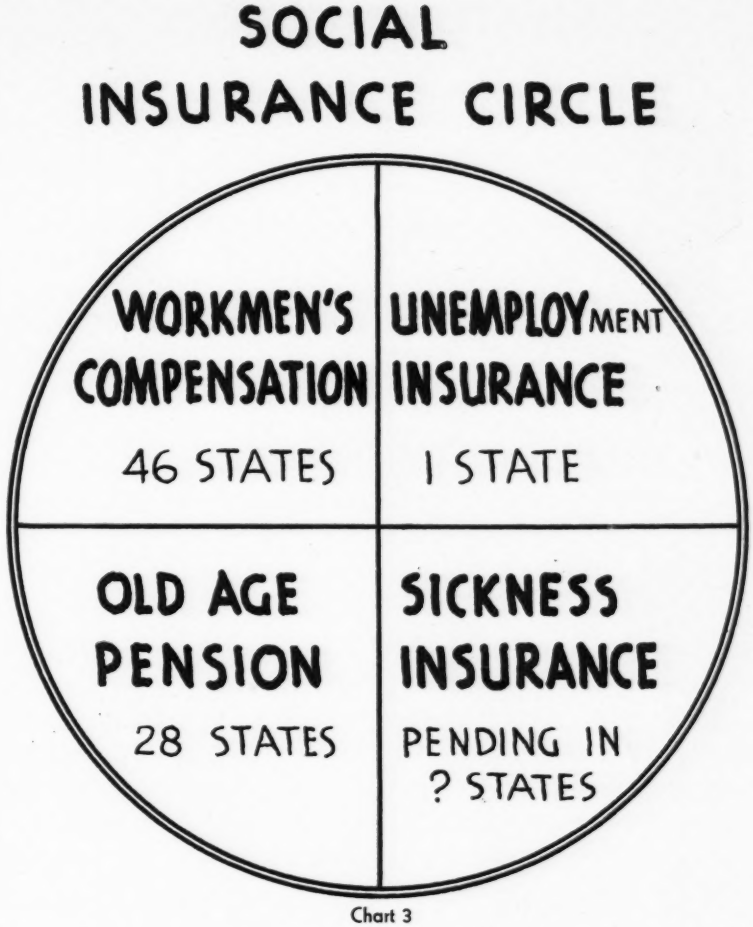

Chart 3

Private Practice and Third Party Practice

We cannot understand third party practice without a short analysis of private practice (Chart 4). In private practice, the patient, through the exercise of a free choice, selects a practitioner to give him health service. The practitioner meets the patient on the basis of the age-old tradition that the patient's welfare is of primary interest. As an outgrowth of this tradition, the close personal relation so necessary to good medical care is developed between the patient and the practitioner. These three traditions, *free choice, patient welfare of primary interest,* and *personal relation* are the values in professional service that the professions themselves feel must be maintained and perpetuated if good health service is to be provided.

Method of Payment—The method of payment under private practice (and note that this is listed, not under the head of Traditions, but under the head of Method of Payment) is individual payment of a fee fixed by the sliding scale with free care of the indigent.

Recently professional groups have declared that the burden of free care for the indigent is too great for the professions to carry, and they as well as prominent lay groups now declare that the community must assume full responsibility for payment to the practitioner for the care of the indigent. All groups on the Committee on the Costs of Medical Care made this declaration.

As soon as we admit the community responsibility for payment, we accept the philosophy of the third party method of payment. Because the third party pays the bills, it is in a position to determine whether or not the traditional values of free choice, patient welfare, and personal relation shall be maintained under the new method of payment. The acceptance of the third party changes the method of payment from the individual fee adjusted by the sliding scale to the fixed fee, salary, or per capita basis.

In order to make a little clearer what is taking place, Chart 5 is presented:

1. *Private Practice Without Interference*—The top figures indicate private practice in which no one interferes between the patient and the practitioner.

2. *Organized Patients As Third Party*—The second group represents the patients organized and the practitioners unorganized. Under these conditions, the third party is composed of the representatives of the organized patients and the practitioners compete for the group practice. This type of practice is responsible for lowering of standards and fees which has developed in contract practice plans in California, Oregon, Washington, and other western states.

3. *Who Shall Dominate When Both Patients and Practitioners Organize?* The third group represents practitioners and patients each organized, and this brings us to the question as to who shall dominate in the third party administration. We are anxious to know who shall dominate when patients and practitioners are each organized because, as is shown in Chart 6, the third party has a great deal of power and controls all the functions listed on this chart.

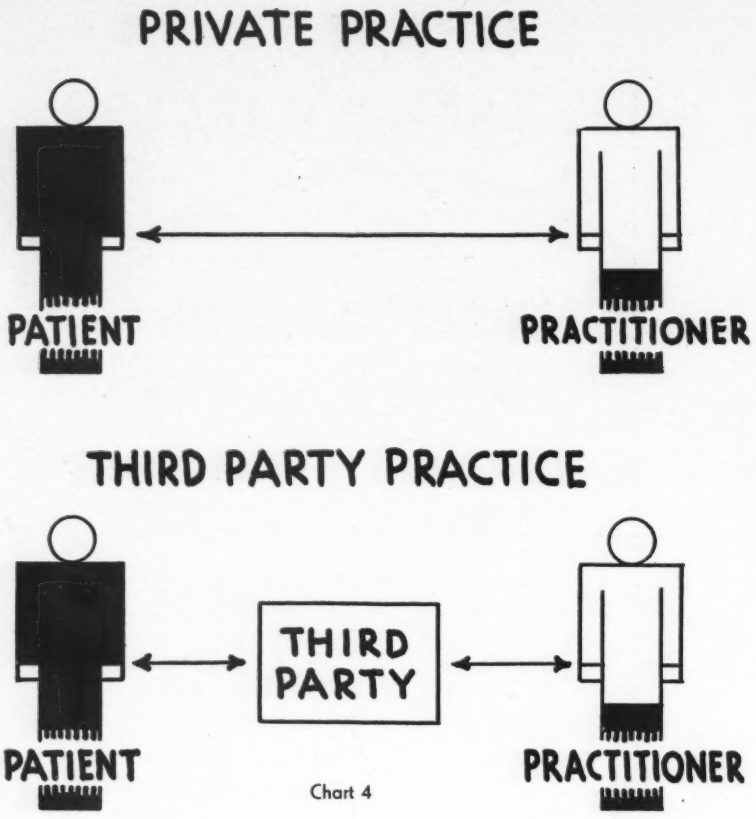

Chart 4

Third Parties in the Past—Chart 7 shows groups that have already acted in the United States as the third party and as one goes over that list, it will no doubt bring to mind all the protests that have been raised in the past against insurance, contract, or other new methods of payment. It will be noted that the last on the list of those that have acted as third party are the professional groups. Professional control has, of course, been rare, but did occur in the Chicago Dental Society administration of dental service under the Federal Emergency Relief Administration.

Control

Everyone has heard a great deal and has talked a great deal about control of professional service under insurance schemes or contract practice. The question arises, where does this control originate?

I have broken up the third party arbitrarily into seven sections (Chart 8). It might just as well have been three or twenty-one to represent the number of individuals or units of control centered in the third party. The patient representatives are in a position to determine whether all those units of control will be in their own hands or whether they will give one, two, three, or four units, or complete control to practitioner representatives. The patient representatives are the ones who pay for service and they determine the units of proportion of the control they are willing to turn over to the practitioner representatives.

Motivation

The next question, which is of paramount importance to the patient, is the motive of the third party (Chart 9). When we analyze the motives that dominate the different groups that have in the past acted as third parties, we find that they are divided between those whose motive is profit and those whose motive is low cost. When the motive is profit, it supersedes the motive of patient welfare. When the motive is low cost, it invites inferior service because of competition. Profit and low cost motives involve the serious implications of the last column in Chart 9.

The profit motive and the patient welfare motives are at direct variance to each other and the two cannot function in the same service. Low cost cannot serve as a motive if the patient's welfare is to be kept in mind. The motive of the third party, then, is the important factor in establish-

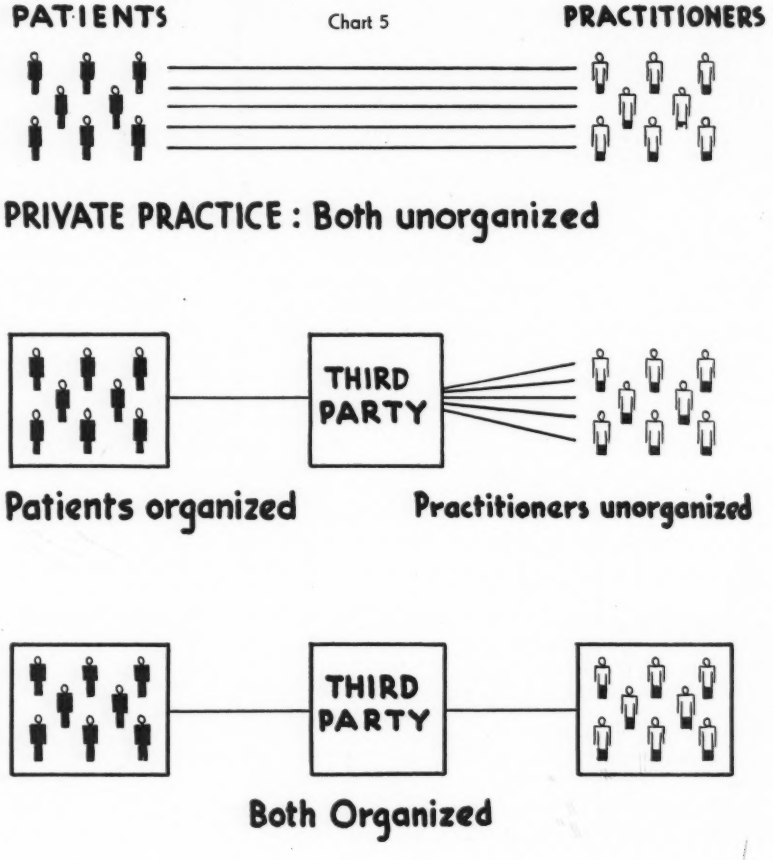

Chart 5

CHART 6

THE THIRD PARTY: Acts as negotiator with groups or individuals for health care.
Sets standards.
Determines method of payment.
Speaks for group or groups; arranges contracts.
Determines whether professional values will be maintained.

CHART 7

THIRD PARTIES:
Government (State or Socialized Medicine).
Industries.
Insurance Carriers.
Trade Unions.
Lodges.
Universities.
Commissions under Government Supervision in Compulsory Health Insurance.
Professional Organizations.

UNITS OF CONTROL

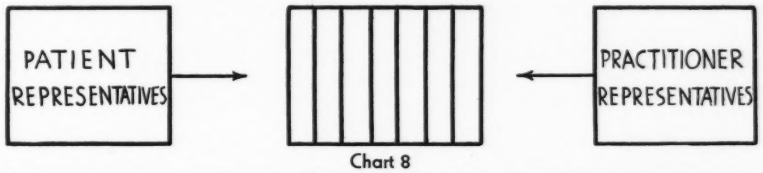

Chart 8

CHART 9

WHEN THIRD PARTY IS:	MOTIVE IS:	INVOLVES:
Contract Agent	Profit	
Industry	Profit Indirectly	
Insurance Carriers	Profit	Loss of High Standards
Lodge	Low Costs (Involving Competition)	Loss of Free Choice Loss of Personal Relation Loss of Patient's Welfare
Trade Unions	Low Costs (Involving Competition)	
Government	Low Costs for Indigents	

		MAINTAINS:
Professional Organizations	Patient's Welfare	High Standards of Service Free Choice Personal Relation Patient's Welfare

CHART 10

PROFESSIONAL GROUPS	PATIENT GROUPS
may act as Third Party only when patient's welfare is paramount and professional values are maintained.	with health interest protected by the professional Third Party.
FUNCTION	**FUNCTION**
1. Decides on extent of service that fund can purchase. 2. Sets standards. 3. Routes services. 4. Fixes fees. 5. Arranges panel. 6. Disciplines members not maintaining standards or traditions. 7. Advises as to need for increase in fund. 8. Signs and issues checks honored by fund in payment of practitioner's service.	1. Decides on amount of fund available for health care and collects fund. 2. Has representatives negotiate with professional Third Party and contract for service. 3. Decides on voluntary or compulsory form of payment. 4. Presents patient's complaints. 5. Issues credentials to members qualifying them for service of practitioners of choice.

ing a new method of payment, as it may mean low grade service for the patient. On the other hand, it may mean the high type of service that could be rendered when the professional organization functioning as the third party collectively offers to the patient group the same tradition of patient welfare as motivated private practice. A professional third party can maintain high standards of service, free choice, personal relation, and patient welfare.

Let us suppose that a group of patients feel that they can pay for their health service under an insurance system more easily than as individuals (Chart 10). They desire to maintain the high standards of service. Under what conditions could they transfer control to the professional groups? On what basis may the patient group award units of control (Chart 8) to the professional groups? When patients as individuals came to the practitioner as private patients, they were perfectly willing to leave with the practitioner all questions of treatment and procedures. They were also perfectly willing to leave to the practitioner the question of fees. If the practitioners can collectively through their organization maintain the same tradition of patient welfare when dealing with groups of patients, then the patient group may with confidence leave fees and procedures in professional hands. When the professional group has transferred, as suggested in Chart 9, the private practice tradition of patient welfare paramount, the patient group, with its health interest protected by a professional third party, needs only decide on the questions in the last column under Patient Group Function, Chart 10. The professional groups, utilizing the status, prestige, and tradition of patient welfare paramount, may decide all the questions listed under Functions of Professional Groups, Chart 10.

Professionalism linked to science has been the drive behind all health service achievement in the past one hundred years. Society has gladly and willingly placed its health problems in professional hands. New methods of payment are being considered. If the professions abide by the implications of professionalism and science, the public may with confidence depend on them to maintain the relations that have governed in the past, and new methods of payment for health service instead of being a menace may become a step in human progress.

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S. JUNGSTER MINK was graduated from the New York University College of Dentistry with the degree of D.D.S. in 1919 where for four years Doctor Mink was director of inlay technique and is now with the Child Research Division, department of preventive dentistry of his university. Doctor Mink is a member of the A. D. A. and the First District Dental Society of the State of New York. His practice is general.

The Editor's Page

CHRONIC arthritis presents a clinical problem of concern to the dentist. The interpretation of oral symptoms and the evaluation of oral disease in terms of a chronic systemic infection often taxes the judgment and the imagination of the practicing dentist.

Two eminent internists, Irons[1] and Cecil[2] have recently reported on the treatment of chronic arthritis. Irons points out that arthritis is the chief cause of chronic disability, with heart disease, arteriosclerosis, and digestive disorders next in incidence in the order given. Whereas heart disease leads as the cause of death, chronic arthritis is the chief cause of long-time disability. The patient with chronic heart disease lives on an average of from seven to nine years, whereas the patient with rheumatic disease lives usually more than fourteen years with his infection.

Both Irons and Cecil are in agreement as to the classification of chronic arthritis into the atrophic or rheumatoid form and hypertrophic or osteo-arthritic form. The atrophic form is usually found in younger persons. It may present the clinical picture of involvement of several joints; infection is frequently in the etiologic picture, and often the hereditary factor is pronounced. In the hypertrophic form, however, persons at or beyond middle life are usually attacked; the disability may be slight or crippling. It is thought that the hypertrophic form of arthritis does not have an infectious basis but represents the vascular and tissue changes of senescence.

Infection, trauma, dietary errors, metabolic and vascular changes—all are part of the picture of arthritic disease. Both authors emphasize that no one cause and no single form of treatment is applicable to a particular person. Irons stresses the fact that arthritis is a total personality disease: "The patient and his disease are to be treated rather than his joints or one assumed etiologic factor alone."

Physicians as well as dentists frequently have fallen into the error of interpreting the characteristic and spontaneous remissions of arthritis with removal of diseased teeth. Frequently patients have improved in health following the extraction of teeth. The physician and the dentist in such cases are likely to reason by the process of a seeming cause and effect that the improvement in symptoms is due to the extraction. Both Irons and Cecil emphatically point out that even in the face of absence of treatment of any kind, arthritis shows peaks and valleys of recurrences and remissions. Likewise, both authors call attention to the unknown underlying hereditary influences which may be present, and must be considered "when one recalls the high incidence of focal infections in persons who do not suffer from arthritis or other demonstrable organic disease."

Dental foci may act either as a direct or contributing cause of chronic arthritis. Cecil believes that rheumatoid arthritis is a chronic streptococcus infection. In this concept, dental foci may be responsible.

The underlying factors of cellular behavior and response are not understood. It is reasonable to suppose that oral infection may lower the natural resistance or complicate an already established condition by undermining the natural reparative powers. The presence of hereditary or tissue tendency means that the patient is more likely to be vulnerable to the attacks from focal infection.

Neither Cecil nor Irons offers any spectacular method of treatment for chronic arthritis. Both emphasize that treatment must be highly individualized and based on a broad concept of biology. Cecil calls the form of treatment "rehabilitation," which includes rest, elimination of all foci of infection, physical therapy, the occasional use of streptococcus vaccine, and a diet low in carbohydrates and high in vitamin content.

Chronic arthritis in common with other chronic diseases often produces discouragement in the patient with the constant danger of flight to quackery or fantastic forms of treatment. It is significant that the more scientific a presentation is the less likely are we to find dogmatic insistence on a single curative factor. The more authoritative the writer the more restrained is his suggested treatment. Pending the time when specific therapy for chronic arthritis is available, it is safe for dentists and physicians to accept the conservative philosophy and rational therapy of eminent physicians, such as Cecil and Irons.

[1] Irons, E. E.: The Treatment of Chronic Arthritis: General Principles, J. A. M. A. 103:1579 (November 24) 1934.
[2] Cecil, R. L.: The Medical Treatment of Chronic Arthritis, J. A. M. A. 103:1583 (November 24) 1934.

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HUBBUCK'S
PURE
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IMMEDIATE INLAY TECHNIQUE FOR THE PROTECTION OF PREPARED TEETH

S. J. MINK, D.D.S.
New York

IN 1934, at the New York State Dental Convention, I[1] suggested the use of base-plate gutta-percha inlays cemented with oxyphosphate or zinc oxide and eugenol to achieve more thorough protection of prepared teeth. Since then I have adopted other generally used methods, such as aluminum shells, copper bands, and even duplicate inlays. All these methods, however, have certain disadvantages. (1) They may become inefficient over a period of time; for example, when gutta-percha is used, even moderate pressure may dislodge the material, especially in view of the modern practice of making shallow cavity preparations. (2) When copper bands or aluminum shells are used and correct anatomic form is not attained, discomfort is likely to be experienced. (3) As in the use of duplicate inlays, too much time is consumed, thereby adding to the expense of production.

The purpose of this paper is to present a new technique for the construction of immediate inlays, whereby the foregoing objections may be largely or entirely overcome, complete protection assured of the prepared teeth, and the maximum comfort secured to the patient until the completion of his case.

Technique

1. After the tooth is prepared (Fig. 1), a copper-band compound impression is taken of the preparation (Fig. 2).

2. A strip one-half inch wide of 28-gauge pink casting wax is used to encircle the impression (Fig. 3).

3. Then a model is poured immediately by vibrating three-minute-set plaster into the impression (Fig. 4).

4. The model is separated from the impression and the same copper band used as a matrix around the model (Fig. 5).

5. The matrix is trimmed to the occlusal level of the tooth model, and plastolene is used to fill in any space between the band and the model at the cervical.

6. A metal of low-fusing point is then placed in the mold and melted by the application of heat, or poured into position (Fig. 6). The fusing point of the metal should be below 212° F., so that it can be melted or poured immediately against the "green" plaster without the necessity of having to dry the mold first. If fine details are particularly sought, it is advisable to press the molten metal into the cavity just before the metal solidifies, at which point it is semiplastic.

7. After the metal has congealed, the setting time being approximately two minutes, the cast is removed and separated from the matrix. The occlusal surface is then shaped with a vulcanite finishing bur or a heated instrument, such as a Roach carver (Fig. 7).

8. The temporary inlay of fusible metal is polished by the use of rubber wheels, sandpaper, and cuttlefish discs; then tested in the prepared tooth for contact and occlusion, and set with zinc oxide and eugenol. Owing to the working qualities, namely, softness and malleability, of the fusible alloy, little time is required to establish proper occlusion; nevertheless, the metal is strong enough to withstand all masticatory stress while in use.

9. The patient may now be told to use the tooth freely in mastication, without concern. The continued use of the tooth makes it much more comfortable, because of the stimulation that results from normal functioning. This stimulation is another desirable objective, as it makes for a healthy condition of tooth and tissue.

10. At the next visit, as a result of the comfortable condition thus secured, the patient's confidence has been won and the dentist has removed that barrier of dread and apprehension which so frequently results in a discontinuance of dental treatment.

Advantages

The following are a few important purposes for which the immediate inlay technique described can be used to advantage: (1) to prevent pain in hypersensitive teeth, since the method assures positive protection; (2) to test the vitality of teeth over a period of time prior to insertion of the final restorations; (3) to insure comfortable mastication over an extended period when the patient makes appointments at long intervals; (4) to protect bridge or partial denture abutments during the interval required to construct appliances.

These objectives were actually attained in clinical use of this immediate inlay technique over a period of more than two years.

Conclusion

The added service of eliminating discomfort between visits produces a more tractable and appreciative patient, one who is more likely to return when other treatment is necessary, and who will also give an enthusiastic recommendation whenever occasion arises. Not only does the technique herein presented succeed in pleasing the patient and thereby make for a more profitable practice, but it gives to the dentist the equally important reward of having won the personal esteem and appreciation of a satisfied clientèle.

Illustrations on Opposite Page

Fig. 1—Natural tooth. Cavity prepared for inlay.

Fig. 2—Compound impression; 36-gauge copper band.

Fig. 3—Pink casting wax, 28-gauge, encircling modeling compound impression.

Fig. 4—Plaster model of prepared tooth.

Fig. 5—Copper band used as matrix with plastolene seal.

Fig. 6—Fusible alloy poured into place.

Fig. 7—Fusible metal inlay finished with burs, discs, and Roach carver.

Fig. 8—Zinc oxide and eugenol cement.

Fig. 9—Completed fusible metal inlays actually used in practice.

[1] Transactions of the Dental Society of the State of New York, May, 1925, page 125.

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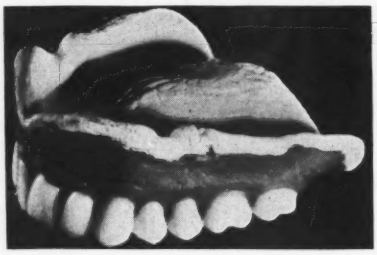

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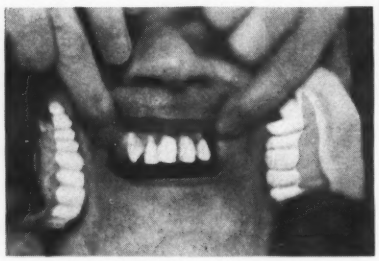

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LETTERS TO THE EDITOR

Do Not Pack and Do Not Irrigate!

In the article by Doctors Field and Ackerman, Displaced Roots in Maxillary Sinus, which appeared in the October, 1934, issue of The Dental Digest (Page 340), it was stated under step 5 of the Technique, the following: "The soft tissue is now replaced and sutured into position. A small drain should be changed every forty-eight hours and the sinus irrigated with warm physiologic solution of sodium chloride. An irrigation can and not the ordinary syringe should be used. As the granulations form, the opening from the mouth into the sinus will be slowly closed until complete healing has ensued."

Undoubtedly Doctors Field and Ackerman have had success with this procedure, but I have seen many cases which were unsuccessful because of this treatment. The continued irrigation, no matter how lightly it is attempted, and the every two-day change of packing traumatizes the edges of the wound; possibly only slightly, but some, nevertheless. The continued presence of the gauze pack also creates chronic irritation. Irritation and trauma are two major events we wish to prevent in the healing of wounds.

Information from authoritative sources in the ranks of rhinologists and my own cases of antrum closure convinces me that the better method would be to close the opening completely. If necessary the buccal bone should be removed to permit this. *Do not pack and do not irrigate!*

The antrum may or may not need postoperative irrigation. Symptoms necessarily govern this need in individual cases. If irrigation is indicated, it can more safely be done by anesthetizing, with cocaine, the inferior turbinate and inserting an ordinary spinal puncture needle into the antrum. The irrigation can be accomplished in this manner without the danger of separating the approximated edges of the oral tissue. Naturally, unless one is adequately trained, this treatment falls into the field of the ear, nose, and throat specialist.

This difference of opinion is not original; but I have found by its application that postoperative closures seem to do better than those cases I have observed in which the oral irrigations were used. —Seth W. Shields, D.D.S., *Darlington, Indiana.*

In the July issue of The Dental Digest is the first of another series of charts on the Education of the Dental Patient. I believe this is the most constructive chart yet published and I would like to have an enlargement to be set on the wall in front of the chair.—J. P. Schock, D.D.S., *Wellston, Ohio.*

May I say that I think The Dental Digest is the best magazine published. The photographs and drawings tell more than many written pages of other publications.—Dean H. Fraser, *Chillicothe, Illinois.*

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The names of the laboratories who wrote these letters will be sent on request.

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